REMARKS

Claims 1-34 are pending and are rejected. Claims 1, 10, 11, 19, 21 and 22 are amended. New Claims 35-38 are added. Reconsideration and allowance of Claims 1-38 are respectfully requested.

Objections to Drawings

The drawings are objected to. In response thereto, Applicants submit a set of replacement (e.g., formal) drawings in compliance with 37 CFR 1.84, which are attached hereto under separate cover. No new matter is introduced.

Amendments to Specification

Applicants amend paragraph [0065] to correct a clerical error, and amend paragraph [0033] to include updated status information for a referenced U.S. Patent Application. No new matter is introduced.

Claim Amendments

Claims 10, 11, 19, and 21 are amended to correct clerical errors.

Claims 1 and 22 are amended to clarify that which the Applicants regard as the invention. Support for the amendment of Claims 1 and 22 may be found in Applicants' specification at paragraph [0081]. No new matter is introduced.

Claim Rejections under 35 USC §102 over Blake

Claims 1, 9-10, 22-26, and 31-32 are rejected under 35 USC §102(b) as being anticipated by Blake et al, "An Architecture for Differentiated Services," RFC 2475, December 1998, hereinafter referred to as Blake. Applicants respectfully traverses these rejections.

Independent Claim 1

Applicants' Claim 1 recites (as amended):

A traffic management processor for processing a plurality of different traffic flows on a per-flow basis, each traffic flow including any number of packets each

including a flow identification (ID) indicating to which traffic flow the packet belongs, comprising:

means for tracking each packet according to its flow ID; and

means for scheduling each packet according to its flow ID.

Blake fails to disclose or suggest a traffic management processor that processes different traffic flows on a per-flow basis, as recited in Applicants' Claim 1.

Applicants' Claim 1 recites a traffic management processor that processes different traffic flows on a per-flow basis by tracking and scheduling each packet according to its flow ID, where the flow ID indicates which traffic flow the packet belongs to. In contrast, Blake discloses a traffic routing architecture that processes aggregated traffic by "applying per-hop behaviors to aggregates of traffic which have been appropriately marked using the DS field in the [packet] headers."[1] Thus, for Blake's architecture, a packet's DS codepoint identifies a behavior aggregate or traffic type, NOT the particular traffic flow to which the packet belongs.[2] Indeed, Blake specifically states that "per-application flow or per-customer forwarding state need not be maintained within the core of the network,"[3] and therefore seems to teach away from the per-flow management process recited in Applicants' Claim 1.

The Office Action states that Blake discloses "a traffic management processor (Figure 1, page 16) for processing a plurality of different traffic flows, each traffic flow including any number of packets each including a flow ID (DS codepoint in page 4) indicating to which traffic flow the packet belongs, comprising: means for tracking each packet (Classifier in Figure 1, page 16) according to its flow ID (DS codepoint in page 4); and means for scheduling each packet (Traffic conditioner, page 7, in view of Figure 1 in page 16) according to its flow ID (DS codepoint in page 4)." Applicants disagree.

First, the Office Action seems to equate Blake's "DS codepoint" with the flow ID

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1 See Blake, page 3, second paragraph.

2 See Blake, page 12, section 2, which provides: "Each behavior aggregate is identified by a single DS codepoint. Within the core of the network, packets are forwarded according to the per-hop behavior associated with the DS codepoint."

3 See Blake, page 3, second paragraph.

recited in Applicants' Claim 1. However, while the flow ID recited in Applicants' Claim 1 indicates which traffic flow a corresponding packet belong to, Blake's DS codepoint is used to assign packets to a particular traffic type (e.g., to a particular traffic behavior aggregate). Indeed, Blake specifically states that the DS codepoint is used to select a per-hop behavior (PHB),[4] which is "the externally observable forwarding behavior applied at a DS-compliant node to a DS behavior aggregate."[5] Thus, in contrast to the flow ID of Applicants' Claim 1, Blake's DS codepoint does NOT indicate which traffic flow the packet belongs to, but instead the DS codepoint is a value that can be used to assign the packet to a particular traffic behavioral aggregate.

Second, the Office Action seems to equate Blake's "classifier" with the "means for tracking each packet" recited in Applicants' Claim 1. However, while the "means for tracking" recited in Applicants' Claim 1 tracks each packet according to its flow ID (and thus according to the packet's traffic flow), Blake's classifier simply "steers the packets to a logical instance of a traffic conditioner."[6] Accordingly, Blake's classifier does NOT track packets on a per-flow basis according to flow ID, as recited in Applicants' Claim 1.

Third, the Office Action seems to equate Blake's "traffic conditioner" with the "means for scheduling each packet" recited in Applicants' Claim 1. However, while the "means for scheduling" recited in Applicants' Claim 1 schedules each packet according to its flow ID (and thus according to the packet's traffic flow), Blake's traffic conditioner performs shaping and policing functions on aggregated traffic according to traffic type or behavior. More specifically, Blake's traffic conditioner changes the DS codepoint of a packet according to its traffic type so that the packet is added to the corresponding behavior aggregate.[7] Blake further provides that "when packets exit the traffic conditioner of a DS boundary node the DS codepoint of each packet must be set to an

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4 See Blake, page 4 (definition of "DS codepoint").

5 See Blake, page 6 (definition of "PHB").

6 See Blake, page 15, section 2.3.3.

7 See Blake at page 16, section 2.3.3.2, which provides: Packet marker set the DS field of a packet to a particular codepoint, adding the marked packet to a particular DS behavior aggregate. The marker may be configured to mark all packets which are steered to it to a single codepoint, or may be configured to mark a packet to one of a set of codepoints used to select a PHB in a PHB group."

appropriate value."[8] Accordingly, Blake's traffic conditioner does NOT schedule each packet according to its flow ID, as recited in Applicants' Claim 1.

To anticipate a claim under 35 USC §102, each and every element of the claim must be disclosed in a single reference[9]. The exclusion of a claimed element from a prior art reference is typically enough to negate anticipation under 35 USC §102. Thus, because Blake fails to disclose or suggest a traffic management processor including "means for tracking each packet according to its flow ID" and "means for scheduling each packet according to its flow ID," as recited in Applicants' Claim 1, Claim 1 is not anticipated by Blake. Accordingly, Applicants respectfully request the Office to withdraw the rejection of Claim 1.

Claims 2-11 depend from Claim 1 and therefore distinguish over the cited references for at least the same reasons as Claim 1.

Independent Claim 22

Applicants' Claim 22 recites (as amended):

A method for processing a number of traffic flows on a per-flow basis, each including one or more packets, comprising:

receiving an incoming packet;

determining which traffic flow the incoming packet belongs to; and

scheduling the incoming packet for departure according to which traffic flow the packet belongs.

Blake does not disclose or suggest a method for processing a number of traffic flows on a per-flow basis, as recited in Applicants' Claim 22.

The Office Action states that Blake discloses "determining which traffic flow the incoming packet belongs to" (Classifier in Fig 1, page 16) and "scheduling the incoming packet for departure according to which traffic flow the packet belongs" (Meter and Marker in Fig 1, Page 16). Applicants disagree.

First, as discussed above with respect to Claim 1, Blake's traffic classifier

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8 See Blake, page 16, section 2.3.3.

9 Corning Glass Works v. Sumitomo Electric, 9 USPQ2d 1962, 1965 (Fed. Cir. 1989).

simply "steers the packets to a logical instance of a traffic conditioner." Blake's traffic classifier does NOT determine which traffic flow a packet belongs to, nor has the Office Action pointed to any such language in Blake that discloses "determining which traffic flow the incoming packet belongs to," as recited in Applicants' Claim 22. Indeed, as discussed above, Blake teaches processing aggregated traffic, and specifically discourages per-flow traffic management.

Second, as discussed above with respect to Claim 1, Blake's traffic conditioner, which includes the "meter" and "marker" cited by the Office Action, performs shaping and policing functions on aggregated traffic according to traffic type or behavior, NOT according to each packet's traffic flow. Thus, while the method of Applicants' Claim 22 schedules packets for departure according to which traffic flow the packets belong to, Blake's traffic conditioner changes the DS codepoint of a packet according to its traffic type so that the packet is added to the corresponding behavior aggregate.

Accordingly, because Blake does not disclose or suggest "determining which traffic flow the incoming packet belongs to" and "scheduling the incoming packet for departure according to which traffic flow the packet belongs," as recited in Applicants' Claim 22, Claim 22 is patentable over Blake.

Claims 23-34 depend from Claim 1 and therefore distinguish over the cited references for at least the same reasons as Claim 1.

Claim Rejections under 35 USC §102 over Ohgane

Claims 12-21 are rejected under 35 USC §102(b) as being anticipated by Ohgane (USP 5,875,173). Applicants respectfully traverses these rejections.

Independent Claim 12

Applicants' Claim 12 recites:

A traffic management processor for managing a number of traffic flows each including one or more packets, comprising:

a content address memory (CAM) device having a plurality of rows, each row storing a flow identification (ID) for a corresponding packet, the flow ID indicating to which traffic flow the packet belongs;

a departure time table including a plurality of rows, each coupled to a corresponding row of the CAM device and configured to store a departure time for the corresponding packet; and

compare logic having inputs coupled to corresponding rows of the departure time table, the compare logic for comparing the departure times with each other to determine which departure time is the earliest.

Ohgane fails to disclose or suggest the traffic management processor of Applicants' Claim 12.

The Office Action seems to equate the Figure 6 table of Ohgane's control memory 27 with the CAM device recited in Applicants' Claim 12. However, each row of the CAM of Applicants' Claim 12 stores "a flow ID" that indicates which traffic flow a corresponding packet belongs to. In contrast, Ohgane's table of Figure 6 is merely a table; it is NOT a CAM that is capable of comparing its contents with an input data or search key. Indeed, there is no language in Ohgane that discloses or suggests that the table of Figure 6 is a CAM, as recited in Applicants' Claim 12. Further, Ohgane's table of Figure 6 stores "a peak rate (Tp), a current CAM set value (Ts), the number N of sent ATM cells, a cell_sent flag representing whether an ATM cell in question is sent or not, a cell header and an RM cell payload per virtual channel VC."[10] As known in the art and described in Ohgane, a virtual channel is a time-multiplexed signal path across an ATM network through which packets are transmitted. Therefore, the virtual channel of Ohgane is NOT a flow ID that indicates which traffic flow a packet belongs to. Accordingly, Ohgane does not disclose or suggest a CAM "having a plurality of rows, each row storing a flow identification (ID) for a corresponding packet," as recited in Claim 12.

Further, the Office Action seems to equate the decoder 512, mode switching circuit 515, and selector 516 of Ohgane's CAM 51 with the compare logic recited in Applicants' Claim 12. However, Ohgane's decoder 512, mode switching circuit 515, and selector 516 do NOT compare any values, but rather control the operation of Ohgane's CAM array 511, which as noted by the Office Action stores packet

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10 Ohgane, col. 8, lines 63-67.

transmission times (T). More specifically, decoder 512 selects rows of CAM array 511 for read and write operations, while mode switching circuit 515 and selector 516 together select the source of input data provided to CAM array 511. Further, the transmission times (T) stored in Ohgane's CAM array 511 are compared with an input value (e.g., provided by counter 50); they are NOT compared with each other, as recited in Applicants' Claim 12. Indeed, the portion of Ohgane cited by the Office Action provides "When this time value (T) matches with a value identified by the counter 50, an address where this time value (T) is stored can be determined as a virtual channel VC for the next cell to be transmitted."[11] Thus, Ohgane does NOT disclose or suggest "compare logic having inputs coupled to corresponding rows of the departure time table, the compare logic for comparing the departure times with each other to determine which departure time is the earliest," as recited in Applicants' Claim 12, nor has the Office Action pointed to any such language.

Accordingly, because Ohgane does not disclose or suggest "a content address memory (CAM) device having a plurality of rows, each row storing a flow identification (ID) for a corresponding packet, the flow ID indicating to which traffic flow the packet belongs" or "compare logic having inputs coupled to corresponding rows of the departure time table, the compare logic for comparing the departure times with each other to determine which departure time is the earliest," as recited in Applicants' Claim 12, Claim 12 is patentable over Ohgane.

Claims 13-21 depend from Claim 12 and therefore distinguish over the cited references for at least the same reasons as Claim 12.

Claim Rejections under 35 USC §103

Claims 2-8, 27-30, and 33-34 are rejected under 35 USC §103(a) as being unpatentable over Blake in view of Ohgane. Applicants respectfully traverse these rejections.

Claims 2-8 depend from Claim 1 and therefore distinguish over the cited references for at least the same reasons as Claim 1.

Claims 27-30 and 33-34 depend from Claim 22 and therefore distinguish over

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11 Ohgane, col. 8, lines 19-22.

the cited references for at least the same reasons as Claim 22.

New Claims 35-38

Claim 35 depends from Claim 1 and therefore distinguishes over the cited references for at least the same reasons as Claim 1.

Claims 36-37 depend from Claim 12 and therefore distinguish over the cited references for at least the same reasons as Claim 12.

Claim 38 depends from Claim 22 and therefore distinguishes over the cited references for at least the same reasons as Claim 22.

Support for new Claims 35-36 and 38 may be found in Applicants' specification at paragraph [0095], and support for new Claim 37 may be found in Applicants' specification at paragraph [0081]. No new matter is introduced.

CONCLUSION

In light of the above remarks, it is believed that Claims 1-38 are in condition for allowance and, therefore, a Notice of Allowance of 1-38 is respectfully requested. If the Examiner's next action is other than allowance as requested, the Examiner is requested to call the undersigned at (408) 236-6646.

Respectfully submitted,

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Dated

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